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GENERAL NOTES.

BOTANY.[1]

On the Rate of Movement of Water in Plants. — This subject has been frequently investigated since the time of Hales and Bonnet. Professor Sachs, of Würzburg, gave, as the result of his observations, the rate of 23 centimetres an hour. McNab, in 1871, made use of a solution of a salt of lithium, and traced it in its course through the plant, coming to the conclusion that the rate was 46 centimetres an hour. These values are regarded by Sachs himself and others as too low. The methods are regarded by Professor Pfitzer, of Heidelberg, as unsatisfactory, and he suggested in 1873 another which yielded very remarkable results. He allowed the soil in some flower-pots containing plants to dry so far as to cause drooping of the leaves. Then he noted the position of the leaves by means of needle points, and watered the soil freely. The leaves recovered their former positions rapidly, and the times were observed. The rate of 5 metres an hour was the highest noted. In *Justicia Adhatoda* leaves 25½ centimetres above the ground moved in three minutes after the soil was watered. In 1874 McNab repeated the lithium experiments and obtained a higher rate than before, nearly 40 inches in the hour. Looking upon this as too low, Pfitzer has again experimented, this time with lithium nitrate. The water employed contained one half of one per cent. of the salt. The plants used were cut under the solution, and the cut end immersed therein for a while. Upon removal the plant was cut in lateral halves from above downward, and the parts were tested spectroscopically. Twigs of Philadelphus gave 4½, Amarantus 6, and Helianthus 10 metres in the hour. The highest rate observed was in the case of a sunflower with leaves in bright sunlight; here it was 22 metres in the hour. The results of later observations are promised.

The Influence of Light on the Color of Flowers. — It was shown by Sachs a dozen years ago that the blossoms of many plants can develop normally in perfect darkness. Plants which have a good supply of elaborated material stored up in bulbs or tubers were observed to have flowers of normal shape and color, even when all the leaves had grown and the flower-buds opened in a dark room. If the buds are inclosed in opaque cases, but the leaves exposed to sunlight so that assimilation is unhindered, the color and shape of the flowers remain normal. There were noticed by Sachs a few slight exceptions. Common nasturtium blooming in the dark had flowers more yellow than usual; wall-flower had smaller and brighter yellow blossoms than those which opened in the light; scarlet-runner, brilliant flesh-red flowers; large snapdragon, usually having flowers of deepest red, had, when blooming in the dark, corollas which were white blotched with rose, and on the lower lip had a sulphur-yellow spot. Sorby, in 1873, showed by the spectroscope that diminution in the amount of light prevents the formation of red coloring matter in the corolla of wall-flower, and changes the character of the yellow coloring matter. Askenasy was familiar with these facts last summer when he commenced a series of experiments, the results of which have just been published. He concludes that many flowers need the light in order to acquire their normal color, but others are quite independent of it. This difference may be referred in some cases to defective nourishment of the plant kept in darkness, but this cannot explain all. The observations can be so easily made that we suggest to our readers a repetition of some of the experiments. The plants which gave the most striking results were *Prunella*, *Silene*, *Antirrhinum*, *Pulmonaria*, *Hyacinthus*, and *Tulipa*.

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[1] Conducted by Prof. G. L. Goodale.

TOLMIÆA MENZIESII, of Oregon (a curious rather than handsome saxifrageous plant, related to *Tiarella*), propagates naturally and freely by adventitious buds, produced at the junction of the leaf-stalk with the blade, in the manner of *Begonia*. We have five live plants that show this, sent by Elihu Hall, of Illinois, who calls our attention to the peculiarity. He states that any of the leaves may be taken off and used successfully for propagation. — A. GRAY.

MR. W. F. FLINT sends good specimens of *Astragalus Robbinsii* Gray, from the limestone region about Queechy, N. H.

RATE OF GROWTH OF AGAVE SCAPES. — July 10, 1870. I measured a scape of *Agave sisalensis* to-day, and made two transverse slits with the point of my knife, six inches apart, one above the other, and not far from tip of scape.

July 17th. The tip of scape is to-day 41½ inches higher than it was on the 10th, and the upper incision is 3½ inches and the lower one ⅞ of an inch higher than they were on same day.

July 22d. Three other plants measured to-day, whose scapes are respectively 30, 20, and 16 inches high.

July 25th. In the last seventy-two hours the scapes have grown in height 17⅞, 12¼, and 10½ inches, respectively.

Two transverse incisions were made, one 13¼ inches from the apex of scape, the other 18 inches below this; the upper one has ascended 3½ inches, and the lower one but $\frac{3}{16}$ of an inch.

July 29th. Scape of No. 1 has ascended (its tip) in the last six days 39 inches, and No. 2, 24 inches. (No. 3 was not measured.)

August 5th. Tip of scape of No. 1 has ascended in fourteen days 71 inches, and No. 2, 70 inches.

August 22d. No. 1 has, in thirty-one days, ascended 12 feet and three inches, and No. 2, 12 feet and two inches. — N. B. MOORE, Manatee, Fla.

THE TEETH OF GREEN LEAVES AS ORGANS FOR THE SECRETION OF NECTAR. — The fact that green leaves secrete a saccharine matter has been known since the announcement by Conrad Sprengel, in the last century, that on the stipules of certain *Vicias* there are secreting spots. Schlechtendal, in 1844, described the secretion of "sugar" by the leaves of *Clerodendron* and *Viburnum Tinus.* Unger noticed "sugar-glands" on these and on *Acacia longifolia.* Caspary found similar glands on many plants, but it appears to have been Haustein who first thoroughly investigated their structure. He thought the glands were in most cases modified trichomes or plant-hairs. Reinke has lately reviewed the whole subject, and finds that in addition to the sugar-spots and sugar-hairs there are also modified serrations of the leaf-blade in many plants, which serve as organs for secreting matters; in some cases the exudation is of a saccharine character, but often of a mucilaginous nature. *Prunus Avium* and some other species of *Prunus, Kerria Japonica, Rosa centifolia, Cydonia Japonica, Betula alba,* and many other plants are spoken of in his memoir as possessing leaf-teeth which secrete freely. A few plates accompany Reinke's paper.

BOTANICAL PAPERS IN RECENT PERIODICALS. — *The Journal of Botany, British and Foreign,* March, 1876. On New and Rare Fungi, by W. G. Smith, F. L. S. Two New *Amaryllidaceæ* from Natal, by J. G. Baker, F. L. S. On the Genus *Syringodea* (in Order *Iridaceæ*), by J. G. Baker, F. L. S. The Apetalous Fuchsias of South America, by W. B. Helmsley. Some Contributions to Plant-Chemistry, by A. H. Church. (Analyses of lettuce, Irish moss, water-cress, beech-scales, elm-flowers, outer layers of wheat-grain.) A list of new species of flowering plants in periodicals published in Great Britain during 1875.

Proceedings of the Royal Irish Academy, January, 1875. On Heat as a Factor in Vital Action (so-called), by Geo. Sigerson, M. D. (Concerning the effect of heat on cyclosis, etc., and on the motion of latex.) April, 1875. On the Apothecia of certain Algæ, by William Archer. On a new Fresh-Water Sarcodic Organism, by William Archer. List of Seychelles Myrtaceæ, by J. G. Baker, July, 1875. On the Structure of the Leaves of certain Coniferæ, by Prof. W. R. McNab. (A reëxamination of the microscopic anatomy of the section *Tsuga* of the genus *Pinus.* With plate giving cross sections of the leaves of the six species.)

Botanical Bulletin (Hanover, Indiana), March, 1876. Chia, by Dr. Rothrock. ("Chia" is a mealy preparation made from the roasted seeds of *Salvia Columbariæ.* The meal mixed with water is used as food and as a demulcent drink. Quantities of this seed have been found buried in graves several hundred years old, a fact which indicates that its use is of great antiquity.) Notes on Gramineæ, by A. H. Young.

Comptes rendus, No. 3. A. Müntz, On certain Changes in the Cane-Sugar of Cane-Juice. No. 5. Heckel, On the Spontaneous Periodic Movement in the Stamens of *Saxifraga sarmentosa, umbrosa, Geum acanthifolia,* and in *Parnassia palustris.* The relations of this phenomenon to the arrangement of the floral organs.

Flora, No. 2. Hugo de Vries, On Wood-Tissue which repairs Wounds (not finished). A. Geheeb, On certain Mosses. No. 3. A. de Krembelhuber, Brazilian Lichens. Hugo de Vries, On Wood which repairs Wounds (not finished). Stephan Schulzer, Notes on Fungi. No. 4. Continuations of the foregoing.

Botanische Zeitung. Reinke's paper on Investigation of Growth is continued in the numbers since our last notice, and down to No. 10, March 10th. The paper is of great interest, and will be noticed at some length in the June NATURALIST.

ARBEITEN DES BOTANISCHEN INSTITUTS IN WÜRZBURG, herausgegeben von Professor Dr. Julius Sachs. We resume our notice of this volume of Botanical Contributions from the Würzburg Laboratory with the third part, which begins with a paper by Dr. Hugo de Vries, On the Wilting of Cut Shoots. (De Vries has clearly pointed out the marked difference in effect between cutting shoots under water and severing them with exposure of the cut surface to the air. The former shoots wither far less than the latter.) IX. Hugo de Vries, On Growth in Length of Tendrils which curve on the Upper or the Lower Side. (The effect of irritation to change the rapidity of growth is not local, but is felt in certain cases throughout the tendril. The effect is often continued after the removal of the irritant or the body in contact.) X. Hugo de Vries, On the Mechanics of Living Plants. (Abstract given in Sachs' Text-Book, page 777.) XI. Dr. Emil Godlewski, Dependence of the Elimination of Oxygen from Leaves on the Amount of Carbonic Acid in the Air. (1. Increase in the amount of CO_2 in the air up to a certain limit favors the evolution of oxygen; above this limit it is more or less injurious. 2. This limit varies for different plants: for *Glyceria spectabilis* on clear days, between eight and ten per cent.; for *Typha latifolia*, between five and seven per cent.; for oleander a little lower. . . . 5. Increase in intensity of the light increases the evolution of oxygen.) XII. Dr. K. Prantl, On the Influence of Light on the Growth of Leaves. (Attributing the difference between growth in light and growth in darkness to the pathological condition induced by absence of light.) XIII. and XIX. Professor Sachs, On the Growth of Tap and Side Roots. (An interesting and elaborate memoir, to be hereafter given in abstract in our General Notes.) XIV. Dr. Hermann Müller (Thurgau), On the Protonema and Rhizoids (root-hairs) of Mosses. XV. Dr. Oscar Brefeld, On Alcoholic Fermentation. XVI. Dr. Hugo de Vries, On the Extensibility of Growing Shoots. XVII. Dr. K. Prantl, On the Renewal of the Growing Point in the Roots of Angiosperms. XVIII. Dr. R. Pedersen, Have Variations in Temperature, as such, an Unfavorable Influence on Growth? (Answered in the negative.)

In closing this sketch of the first volume of Contributions from the Würzburg Laboratory, we must be allowed to call attention to an important and excellent feature of the publication, namely, the summary at the end of each article. This has long been the practice of French writers. Its adoption in a work like this gives an increased value which we are all quite ready to appreciate. Furthermore, we must refer to the generally impartial historical outlines which are prefixed to the separate memoirs. Even a busy reader can see what has been done before, and what the upshot of each paper is.

ZOÖLOGY.

Are Potato Beetles Poisonous? — Although I have made no investigations regarding the poisonous nature of the Colorado potato bug, and am prejudiced neither *pro* nor *con*, the experiments of Messrs. Grote and Keyser as stated in the April Naturalist do not seem conclusive to me. I should not consider the innoxious nature of the *Doryphora* proven. Since heat changes many organic substances, it is not impossible that the "liquid" of their experiments may differ entirely from the juices of the living beetle. Their hypodermic injections would seem to prove the idea (if I understand their account correctly) that the beetles do possess some toxical properties. The heart of a frog separated from the body often beats for a longer period than that recorded in their article. Another possible source of error lies in the animal employed in their investigations. All animals are not equally susceptible to the action of poisons. Man is more so than the lower vertebrates, and they even differ among themselves in this respect. Thus it may be that the beetles have qualities injurious to man, while they have no effect on frogs and toads.

In the above remarks I have not endeavored to prove the poisonous qualities of the beetles, but to express my reasons for denying the cogency of the reasoning employed in the article referred to, and to turn the attention of other investigators to the subject. — J. S. Kingsley.

The Labrador Duck. — H. E. Dresser, Esq., the well-known ornithologist, author of the Birds of Europe, is desirous of obtaining information respecting this bird (*Camptolæmus Labradorius*), such as its geographical distribution (past and present), anything tending to elucidate its habits, and, in particular, a list of the specimens known to be preserved in United States collections. In this last matter, will the custodians of collections in which the bird is represented kindly interest themselves? Mr. Dresser furthermore authorizes me to offer £40 ($200, gold), for a pair, male and female, in good order. Communications may be addressed to him, No. 6 Tenterden Street, Hanover Square, London, W., or to the undersigned. — Elliott Coues, Smithsonian Institution, Washington, D. C.

The Cotton Worm. — Mr. Grote, in the last Alabama Geological Report, states his belief that the cotton worm is an imported insect and not indigenous to the Southern States. In Alabama it does not appear on the plants before June or July.